

School Board Meeting:

March 8, 2010

Subject:

K-5 Math Curriculum Adoption

Presenter:

Pam Miller

SUGGESTED SCHOOL BOARD ACTION:

Report only. No recommended action at this time. A request to adopt *enVisionMATH* for our elementary math curriculum will be recommended for you to take action upon at the March 22 school board meeting.

Connection to BHM Mission Statement

The recommended action to adopt *enVisionMATH* supports the following components of the BHM Schools' mission statement, core values, and key results:

MISSION STATEMENT

Making a difference by preparing all students for a successful future in a changing world.

CORE VALUES

- ✚ All students can learn, though at different rates and in different ways.
- ✚ Maximizing learning requires innovation, risk-taking and the ability to change.
- ✚ Continuous improvement is essential.

KEY RESULTS

- ✚ All students demonstrating academic growth and success.
- ✚ Increase student learning and expand instructional strategies by implementing technology.

DESCRIPTION:

Background information

For the past two years, a team of elementary teachers representing all grade levels and all six elementary sites have engaged in research, discussion, and professional reading to determine a recommendation for the future direction of elementary math curriculum and instruction for our district.

The entire planning process included the following steps that will be outlined in this document:

- Reviewing state standards and requirements
- Soliciting stakeholder input from faculty and parents
- Examining educational research and promising practices in math education

- Researching potential curriculum resources
- Piloting resources
- Considering financial implications
- Examining all data collected and formulating a district recommendation

State Standards and Requirements

As you are well aware, the Minnesota legislature has determined grade level standards and benchmarks for math instruction. These state math standards were revised in 2007, with a requirement for local districts to implement the new standards by the 2010-2011 school year. This requirement is in alignment with our local curriculum adoption process. The revised standards include an increase in rigor at all grade levels, as well as a greater focus on algebra readiness skills for students.

Current Program

At the elementary grades, the current math curriculum used is *Everyday Math*. This curriculum has been in place since the mid-1990's. The program contains a "spiraling" curriculum approach. This means some concepts are mastered at some grade levels, but only introduced at others. At the local level, we have established a requirement of 60 minutes of math instruction for Grades 1-5.

Stakeholder Input

Stakeholder input regarding current program strengths and areas to improve was solicited from both faculty and parents. Faculty input was gathered through the Elementary Teaching & Learning Council and the Math Planning Team. Parent input was gathered through an online survey administered in 2009.

Elementary teachers identified the following general strengths of the current Everyday Math curriculum used in our district:

- ✚ Strong district math achievement at the elementary level
- ✚ Provides instruction in most areas of the state standards
- ✚ Students working with manipulatives and engaging in math games at most grade levels provides active learning to help them understand the concepts

Elementary teachers identified the following weaknesses of the current Everyday Math program:

- ✚ Too much content so it is difficult to know what to teach to meet the standards
- ✚ If we cut content out it creates issues at other grade levels because of the spiraling curriculum
- ✚ Lack of understanding of the spiraling curriculum among teachers (lack of professional development to teach the program the way it should be)
- ✚ Differentiation of instruction is very difficult with *Everyday Math*
- ✚ The *Everyday Math* kindergarten program is extremely weak
- ✚ Lack of technology opportunities
- ✚ Does not include best practices for authentic learning

- ✚ It is difficult to know which skills are to be mastered and which are introductory

The online parent survey received great response, with 387 parents providing input. There was a fairly equal number of parents represented across all grade levels K-5 within the responses. The Math Planning Team was pleased to see that overall, parents rated "quality of math instruction" and "teacher's concern for student learning in math" quite highly. Statements ranked lower included "development of math facts" and "quantity of math homework".

Parents were also provided an opportunity to comment on their experiences with open text boxes. We received 15 pages of comments from parents, which included a wide variety of opinions and remarks. Some of the sample comments are included below:

Sample Positive Comments

- ✚ Our son really enjoys math and continues to demonstrate success with your current program
- ✚ Grade 1 teacher does an excellent job of making sure my student is challenged as he is slightly ahead of others in class. I believe great teachers make the difference, not always great curriculum. Of course, it's ideal to have both!
- ✚ My daughter's teacher Mr. Kyllonen is outstanding in all areas. We are new to the district this year, and I could not be happier with our experience than I am. I was very involved in our other district (PTO treas, dist. employee, volunteer 5 - 20 hours per week, etc), so I understand about the workings of an elementary school and am so pleased with our move. Thank you Buffalo District for all the hard work and great staff.

Sample Negative Comments

- ✚ I feel the *Everyday Math* curriculum is poor. It does not require a student to master a skill prior to moving on to the next unit. It jumps around way too much. Please get rid of it!!!!!!!!!!!!!!
- ✚ *Everyday Math* is difficult for parents to understand
- ✚ When I have tried to help my child with math problems or defining terms in a homework lesson or makeup work I go online because the terms and description of how to do the work are with the teacher and usually not in the handouts or book the children use (prime number). This made it difficult to assist my child because I couldn't figure out how without the information the teacher's book had. Long division was hard because I tried the way I learned and my child said no they can't do it that way. One time I even told my son that the value of pi was 3.14 not 2.14. A teacher told me the kids are supposed to learn how to do the work at school not from the books they use. This works if they comprehend and pay attention, etc. If they don't some of us parents are lost and not sure how to help.
- ✚ Aside from more knowledge on the Minnesota Math Standards, how can the parents be aware of the methods the students are using for math?

Being an engineer, I am very versed in the discipline of mathematics although I want to be able to help my child with homework using the same methods taught in school. I didn't learn math growing up the way my child is learning today so where can I learn in order to be consistent.

Sample Comments on What a Good Math Program Should Include

- ✚ It should be more interactive and fun
- ✚ Repetition and fact memorization is a priority
- ✚ The ability for a student to understand how math is important in all aspects of life – not just figuring out what $1+1$ is
- ✚ A greater focus needs to be placed on "When will I use this?" Math is more than being able to complete a "Mad Minute", it is knowing which application to use in what real life situation and then how to do it correctly. IE: When teaching negative numbers show the child that a scientist or a meteorologist uses negative numbers. When teaching adding/subtracting 3 or 4 digit numbers, use a checkbook.

Educational Research and Promising Practices in Math Education

The team then engaged in a large amount of professional reading, searching out promising practices information in math education. We read and discussed the work endorsed by the National Council of Teachers of Mathematics, and we examined the findings in the National Math Panel Report.

The National Council of Teachers of Mathematics (NCTM) developed six pillars that they refer to as essential to a "Foundation of a High Quality Math Program." The foundation needs to include considerations in the six areas of equity, curriculum, teaching, learning, assessment, and technology. They are defined as follows:

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|---------------------------|---|
| <i>Equity.</i> | Excellence in mathematics education requires equity—high expectations and strong support for all students. |
| <i>Curriculum.</i> | A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades. |
| <i>Teaching.</i> | Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well. |
| <i>Learning.</i> | Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge. |
| <i>Assessment.</i> | Assessment should support the learning of important mathematics and furnish useful information to both teachers and students. |
| <i>Technology.</i> | Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning. |

The Math Planning Team discussed classroom implications and barriers to achieving these goals in a math program. Many of the barriers identified, as you would predict, deal with lack of time available for professional development among all teachers, limited financial resources, and facilities limitations.

The five summary statements we took away from the National Math Panel Report were:

- ✚ We need to be aware of and consider the strong importance of algebra readiness skills.
- ✚ Algebra readiness skills require a strong conceptual understanding of fractions, decimals, and percents.
- ✚ It is important to understand the relationship between all areas of math and focus on a balance of math facts and math reasoning.
- ✚ We should accelerate the properly motivated high-ability students.
- ✚ Knowledge of math instruction prior to and beyond your own grade level is extremely important to understanding the “big picture” of the scope and sequence in a child’s math learning.

Desired Results

Once we had established where we are at currently as a district and learned about promising practices, we created a document that outlined the results we were looking for and trying to achieve with students. The development of these results provided the team with the vision needed to move forward in planning future direction. What the team discovered in that process was there is large gap between what we should be doing and what we are currently doing, so change was warranted to be able to achieve the results we believe to be possible with our students.

Potential Curriculum Resources

The Math Planning Team discussed possible options that could aide the district in achieving those results, then examined math curriculum materials available. We also developed a curriculum evaluation matrix to be used during the evaluation process.

The team investigated seven math curriculum programs initially, then invited vendors from four of these seven programs in for a program overview. The programs selected for comprehensive program overviews were *enVisionMATH*, *Everyday Math*, *Math Connects*, and *Math Expressions*. From those vendor presentations, two programs were then selected for further consideration during our pilot period. The two programs selected were *enVisionMATH* and *Math Expressions*.

<i>Program</i>
<i>enVisionMATH</i>
<i>Investigations</i>
<i>Trailblazers</i>
<i>Everyday Math</i>

<i>HSP Math</i>
<i>Math Expressions</i>
<i>Math Connects</i>
<i>Singapore Math</i>

Green = considered first round only
 Blue = considered through rounds 1-2
 Red = continued consideration into pilot 2009-10

Math Curriculum Pilot – September 2009-January 2010

Twenty-four pilot teachers were recruited and trained to try the materials in their classrooms from September 2009 – January 2010. At the end of January, all pilot teachers were invited to share their experiences piloting the two programs to assist the planning team in developing a district recommendation.

Of the twenty-four pilot teachers, there were four teachers at each grade level. When asked to share their experiences piloting the materials and what their personal preference would be, the intermediate teachers in grades 3-4-5 were completely unanimous in their personal preference for *enVisionMATH* over *Math Expressions*. At grades K-2, the personal feelings were split. Basically two teachers at each of these grade levels preferred *enVisionMATH*, and two teachers preferred *Math Expressions*. A few teachers expressed opinion that either program would be a good fit for the district, especially over the current *Everyday Math* program.

The twenty-four pilot teachers and additional planning team members then discussed four options for future district direction: (1) do nothing and stick with *Everyday Math*, (2) renew *Everyday Math* to the latest version, (3) adopt *Math Expressions*, or (4) adopt *enVisionMATH*. After much discussion, they were asked to provide their opinions for a district recommendation. The results were as follows:

Total of 29 teachers (<i>pilot teachers and additional planning team members</i>)	
Stick with <i>Everyday Math</i>	1
Adopt <i>Math Expressions</i>	4
Adopt <i>enVisionMATH</i>	23

The percentage of pilot and planning teachers providing an opinion of a district recommendation to adopt *enVisionMATH* is 83%.

Some of the comments shared about *enVisionMATH* were:

- ✚ "I really like *enVisionMATH* and so do my students. They are concerned about what will happen if we have to give this program back."
- ✚ "I looked at both programs through the lens of multiple intelligences. In considering both programs, I feel *enVisionMATH* has more to offer in the area of reaching the different learning styles and multiple intelligences."

- ✚ "One of my students told me, 'The homework for *enVisionMATH* makes me think."
- ✚ "*enVisionMATH* includes more real-world connections for the kids."
- ✚ "I took a heads down vote in my classroom yesterday. The outcome was 19-3 in favor of *enVisionMATH*."
- ✚ "The tests and assessments match the learning in *enVisionMATH*."
- ✚ "The kids are so excited about math with *enVisionMATH*."
- ✚ "Differentiation was easy and the materials were right there to use with *enVisionMATH*."
- ✚ "The technology opportunities are great with *enVisionMATH*."

District Recommendation

On January 28, 2010, the Math Planning Team then met to review all the data collected to date, and in the end, **unanimously** supported a district adoption of *enVisionMATH* for implementation in the 2009-2010 school year.

In reviewing all the data collected over the past year and a half, the team felt this is an excellent decision for the students in our district. The program supports best practice, research, and development in math education.

The *enVisionMATH* program is a Scott Foresman-Addison Wesley product. It boasts daily problem-based interactive math learning followed by visual learning strategies to deepen conceptual understanding by making meaningful connections for students and delivering strong, sequential visual/verbal connections through a visual learning bridge in every lesson. There is a strong technology component included in the program with opportunities for teachers to enhance tech integration in their math instruction, as well as online access for students both at school and at home.

Financial Implications

I am still in the negotiating process to reach the final agreement for the cost for the K-5 *enVisionMATH* materials for our district. I am working with principals to determine the exact number of materials needed for classroom teachers, students, and teachers supporting classroom instruction such as Special Education, Title I, and ELD teachers. The approximate cost for the complete adoption is \$197,682. On a per student basis, this works out to \$74.15 per student. To give you a comparison, our literacy adoption in 2008 was \$100/student. As the second of the two largest curriculum areas in elementary education, this cost is what we anticipated for a math adoption. Elementary principals have budgeted the amount needed from their site instructional supplies budgets. Most of the elementary principals are paying for the materials out of two budget years – 2009-10 and 2010-11. Since there was no new elementary curriculum implemented during the 2009-10 school year, this is the prudent thing to do.

Next Steps

The next steps towards a successful implementation of *enVisionMATH* is to discuss and plan for all challenges we will encounter in helping teachers transition from the current program. I have established an *enVisionMATH* Implementation Team consisting of teachers from all grade levels and all elementary sites. This team will be responsible for planning and facilitating some of the training activities associated with the implementation.

Once the adoption is approved, the first initial program overview training will occur March 26, 2010. This is a half-day site staff development date that principals have agreed to commit to math implementation. We will order materials to arrive prior to the end of the school year so teachers can begin reviewing and planning for implementation next fall. I will be offering some summer professional development opportunities for elementary teachers. We will also dedicate one full district staff development day on September 2nd to *enVisionMATH* training, and we will offer additional *enVisionMATH* technology training opportunities at various times this spring and next fall.

The entire process has been very enjoyable and yet another example of excellent teamwork by the teachers in our district. They are truly committed to providing students with the best instruction possible.

At Monday's board workshop, I will share additional information about the curriculum resources. In addition, two teachers who were involved in the planning and piloting process, Heather Schaaf and Denise Casey, will also share their experiences. Both Denise and Heather have also volunteered to be a part of the *enVisionMATH* Implementation Team. We will be happy to answer any questions you may have at that time.